REMARKS

Applicants respectfully request that the above-identified application be reexamined.

Claims 1-21 are pending in this application. An Office Action mailed August 24, 2007 (hereinafter "Office Action"), provisionally rejected Claims 1-21 on the ground of non-statutory obviousness-type double patenting as being unpatentable over Claims 22-38 of co-pending U.S. Patent Application No. 11/150,951. Claim 17 was objected to because of informalities. Claims 1, 3, 8, 10, 15, and 17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,535,387, issued to Matsuoka et al. (hereinafter "Matsuoka et al.") in view of U.S. Patent No. 6,581,104, issued to Bereiter (hereinafter "Bereiter"). Claims 2, 7, 9, 14, 16, and 21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Matsuoka et al. and Bereiter in view of Applicant's Admitted Prior Art (hereinafter "AAPA"). Claims 4-6, 11-13, and 18-20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Matsuoka et al. and Bereiter in view of Saulpaugh et al. (hereinafter "Saulpaugh et al.") Claims 1, 8, 15, and 17 have been amended to more clearly recite the claimed subject matter and to more clearly recite the claimed subject matter and to correct typographical errors.

Pursuant to 37 C.F.R. § 1.111 and for the reasons set forth below, applicants respectfully request reconsideration and allowance of the pending claims. Prior to discussing in detail why applicants believe that all the claims in this application are allowable, a brief description of the disclosed subject matter and brief descriptions of the teachings of the cited and applied references are provided. The following discussions of the disclosed subject matter and the cited and applied references are not provided to define the scope or interpretation of any of the claims of this application. Instead, these discussions are provided solely to assist the United States Patent and Trademark Office in recognizing the differences between the pending claims and the cited references, and should not be construed as limiting on the disclosed subject matter.

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Disclosed Subject Matter

A system and method for cooperative automated execution of distributed tasks by a set of computers without a centralized controller are disclosed. Execution of a sequence of tasks is coordinated through the cooperation of peer computers in a network environment. A software execution agent running on each of the peer computers coordinates cooperative execution of the tasks relative to other computers in the set of networked peer computers. Task execution instructions including the sequence of the tasks to be executed and the corresponding computers that are to perform the individual tasks are transmitted to a first computer in the set of peer computers. The first computer transmits the task execution information to the other peer computers. The execution agent of each of the peer computers communicates with other execution agents running on the other peer computers for status update and synchronization of the execution of the tasks.

Summary of Matsuoka et al.

Matsuoka et al. is directed towards a method and system for uniform load distribution in a parallel processing computer. The parallel computer includes a plurality of processors for executing individual processes, a network for conducting communication between the plurality of processors, and a synchronizing mechanism for issuing an execution start command for a next step to all the processors in the parallel processing computer. (Matsuoka et al., Col. 1, lines 38-65.) The disclosed method includes executing by respective processors only the individual processes whose output data in a current step are used immediately in a next step, informing the completing of the execution, immediately after the execution has been completed, to said synchronizing mechanism, and wait until the execution start command for the next step is issued.

Summary of Bereiter

Bereiter discloses a method for balancing loads during data distribution in a managed network environment using a gateway machine that serves a plurality of end point machines.

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(Bereiter, Abstract.) Load balancing is achieved by setting a load parameter for each subnet of each network path between the gateway machine and an end point machine. The load parameter identifies the network bandwidth that may be used by a particular data distribution over the network segment. The effective load that a given subnet will experience is calculated prior to distributing the data. If the effective load for the subnet exceeds the subnet's load parameter, the data distribution rate is altered, or delayed, for the network path segment, altering the overall data distribution rate for the network path. This technique purportedly balances network loads and uses computing resources more efficiently. (Bereiter, Col. 2, lines 32-48.)

Summary of Saulpaugh et al.

Saulpaugh et al. discloses a method and a system for migrating applications from one machine to another machine on a network. Saulpaugh et al. discloses Java language related technologies migrating an application from one machine to another on a network, including the internal and external states of the application as included in a persistent memory heap. The persistent memory heap may include code and data structures for use in the application. Such data structures may include data for tracking internal and external references to objects in different sections of the heap. An internal reference to an object may be defined as a reference to an object from another object in the same section of the heap. An external reference is a reference to an object from another object in another section of the heap. Applications running on one Java virtual machine (JVM) may be migrated to another JVM on another machine across the network by transmitting the application code as well as the persistent heap.

Rejection of Claims 1-21 Obviousness-Type Double Patenting

As indicated above, Claims 1-21 were provisionally rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over Claims 22-38 of co-pending U.S. Patent Application No. 11/150,951. A Terminal Disclaimer is filed herewith, rendering the rejection moot. Accordingly, applicants respectfully request that the obviousness-type double patenting rejection be withdrawn.

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Objection to Claim 17

As indicated above, Claim 17 was objected to because of informalities. Claim 17 has been amended to depend from Claim 15. Accordingly, applicants respectfully submit that the objection is moot and request that the objection be withdrawn.

Rejection of Claims 1, 3, 8, 10, 15, and 17 Under 35 U.S.C. § 103(a)

As indicated above, Claims 1, 3, 8, 10, 15, and 17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Matsuoka et al. in view of Bereiter. Applicants respectfully disagree for the reasons set forth below. Amended independent Claims 1, 8, and 15 substantially recite similar features. Accordingly, Claim 1 will be used as a representative claim for the discussions below. Amended independent Claim 1 recites, in its entirety:

> 1. A computer-readable medium having computer-executable instructions for performing steps for coordinated execution of distributed tasks, comprising:
>
> receiving, by **a first computer in a group of peer computers**, each of the peer computers having at least one processing unit and one peripheral device, a set of execution instructions for the peer computers, the **execution instructions including a sequence of tasks to be performed and an assignment of the tasks to the peer computers**;
>
> forwarding, by the first computer to the other peer computers in the group, **execution instruction information derived from the execution instructions** such that each peer computer in the group is informed of tasks assigned thereto in relation to tasks assigned to the other peer computers;
>
> **executing, by the first computer, tasks assigned thereto** in connection with execution of tasks assigned to the other peer computers in the group; and
>
> **transmitting, by the first computer to the other peer computers**, peer-to-peer **communication messages containing task execution status** to synchronize and coordinate the execution of the sequence of tasks. (Emphasis added.)

Generally, the context of Matsuoka et al. is different from the claimed invention. Matsuoka et al. discloses a system and a method for distributing load over multiple processors within a single computer. The multiple processors are processing units executing different threads of execution within a single computer controlled by the same operating system. The

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present subject matter as claimed in amended independent Claim 1 recites a *first computer* in a group of *peer computers*. Those skilled in the art will appreciate that a processor is not the same as a computer. A computer generally includes a processor plus at least one input device and one output device, as shown in FIGURE 1. A multi-processing computer is simply a computer with multiple processors embedded in the computer hardware for increasing the performance. A multi-processing computer is not the same as multiple networked computers. Matsuoka et al. does not disclose a first computer in a group of peer computers, each of the peer computers having at least one processing unit and one peripheral device, a set of execution instructions for the peer computers, the *execution instructions* including a *sequence of tasks* to be performed *and an assignment of the tasks to the peer computers*, as recited in amended independent Claim 1. Matsuoka et al. discloses a multi-processor computer for executing individual processes and a synchronization mechanism for issuing an execution start command for a next step. (Matsuoka et al., Col. 1, lines 45-53.) Matsuoka et al. shows, in Figure 1, the synchronization mechanism as a simple AND gate 2 that sends a detection of communication completion hardware signal to all of the processors 1_1 through 1_n to start a next cycle of hardware processing. Matsuoka et al. states "synchronizing mechanism for issuing an execution start command for a next step *to all the processors*." (Matsuoka et al., Col. 1, lines 51-52.) Matsuoka et al. does not disclose *receiving by a first computer* in a group of peer computers a set of execution instructions. Matsuoka et al. discloses that "*all the processors* are given *a command to start* the execution of a next step. Multiple calculations are thus carried out by synchronizing all the processors with each other." (Matsuoka et al., Col. 1, lines 41-44.) (Emphasis added.) Matsuoka et al. does not disclose a *first computer, distinct from all other peer computers, by virtue of being selected as a first computer,* in a group of peer computers that receives a set of execution instructions for the peer computers. Additionally, Matsuoka et al. does not disclose a set of execution instructions including *sequences of tasks* and an *assignment of the tasks to the peer computers*. In contrast,

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amended Claim 1 recites that the execution instructions include a sequence of tasks in addition to including a mapping of such tasks to the peer computers.

Matsuoka et al. does not disclose forwarding, *by the first computer to the other computers in the group* execution instruction *information derived from the execution instructions*, as recited in amended independent Claim 1. Matsuoka et al. discloses a plurality of processors for executing individual processing, without disclosing anything about the structure or the nature of such processing. Generally, Matsuoka et al. does not disclose a two-step process of (1) receiving, by a first computer, execution instructions and (2) *forwarding by the first computer to the other peer computers*, execution instruction information. Matsuoka et al. discloses that all processors work in parallel without any one of them being distinguished, as a first processor or a first computer as recited in Claim 1. Furthermore, Matsuoka et al. does not disclose that the first computer forwards information derived from the execution instructions to the other peer computers, as recited in amended Claim 1. Those skilled in the art will appreciate that in a multi-processor computer system, multiple threads of execution, or tasks, are assigned to each of the processors by a scheduling component, in contrast to tasks being forwarded to other processors by one chosen first processor.

Matsuoka et al. does not disclose transmitting, *by the first computer* to the other peer computers, *communication messages containing task execution status*, as recited in amended independent Claim 1. Matsuoka et al. discloses, as noted above, a hardware signal 3 outputted from an AND gate 2 to start a next cycle of execution by hardware processors 1_1 to 1_n as illustrated in Figure 1. Matsuoka et al. does not disclose that *a first computer transmits* communication *messages* containing task execution status *to other peer computers*.

Bereiter does not supply the teachings missing from Matsuoka et al. Bereiter is directed towards a load balancing system in a computer enterprise environment. (Bereiter, Abstract.) Bereiter discloses a method for load distribution using a load parameter for various subnets in an enterprise network. The load parameter is compared to a load of a subnet in terms of bandwidth

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requirement, and if the subnet load exceeds the subnet load parameter, the data distribution rate is altered for the network task to balance the overall load. (Bereiter, Col. 2, lines 33-45.) Bereiter does not disclose receiving by a first computer, a set of execution instructions for the peer computers. Nor does Bereiter disclose a set of *execution instructions* identifying a *sequence of tasks* and an *assignment of the tasks to the peer computers*. Additionally, Bereiter does not disclose forwarding, by the first computer to the other peer computers in the group, execution instruction *information derived from the execution instructions*, as recited in amended independent Claim 1. Furthermore, Bereiter does not disclose transmitting, by the first computer to the other peer computers, communication messages containing task execution status. Therefore, amended independent Claim 1 is submitted to be allowable for at least the reasons discussed above.

As noted above, amended independent Claims 8 and 15 substantially recite similar features as amended independent Claim 1 and are submitted to be allowable for at least the same reasons discussed above with respect to Claim 1.

Claims 3, 10, and 17 depend from Claims 1, 8, and 15, respectively, and are submitted to be allowable for at least the same reasons discussed above with respect to Claims 1, 8, and 15.

Rejection of Claims 2, 7, 9, 14, 16, and 21 Under 35 U.S.C. § 103(a)

As indicated above, Claims 2, 7, 9, 14, 16, and 21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Matsuoka et al. and Bereiter in view of Applicant's Admitted Prior Art. Claims 2 and 7, Claims 9 and 14, and Claims 16 and 21 depend from Claims 1, 8, and 15, respectively, and are submitted to be allowable for at least the same reasons discussed above with respect to amended independent Claims 1, 8, and 15. Applicant's Admitted Prior Art teaches the use of testing to ensure proper functioning of computer hardware and software. (AAPA, paragraph 2.) Applicant's Admitted Prior Art does not disclose the features discussed above with respect to Claims 1, 8, and 15.

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Rejection of Claims 4-6, 11-13, and 18-20 Under 35 U.S.C. § 103(a)

As indicated above, Claims 4-6, 11-13, and 18-20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Matsuoka et al. and Bereiter in view of Saulpaugh et al. Applicants respectfully disagree for the reasons set forth below.

Claims 4-6, 11-13, and 18-20 depend from amended independent Claims 1, 8, and 15, respectively, and are submitted to be allowable for at least the same reasons discussed above with respect to Claims 1, 8, and 15. Saulpaugh et al. does not supply the teachings missing from Matsuoka et al. and Bereiter. Saulpaugh et al. is directed toward process migration from one virtual machine to another virtual machine on a network. Saulpaugh et al. does not disclose any of the features discussed above with respect to Claim 1. Therefore, Claims 4-6, 11-13, and 18-20 are submitted to be allowable for at least the reasons discussed above with respect to Claims 1, 8, and 15.

CONCLUSION

Applicants respectfully submit that all the claims in this application are clearly allowable in view of the disclosures of Matsuoka et al., Bereiter, Saulpaugh et al., and Applicants' Admitted Prior Art. Therefore, applicants respectfully request that this application be reexamined, all of the claims remaining in this application be allowed, and this application be passed to issue. If the Examiner has any questions, the Examiner is invited to contact the applicants' attorney at the number set forth below.

Respectfully submitted,

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